

Seismic Safety Commission
Minutes of Meeting
June, 2002
Hacienda Hotel
4041 Harney Street
San Diego, California

Members Participating

Bruce R. Clark, Chairman
Stan Y. Moy, Vice Chair
Andrew Adelman
William L. Gates
Lucy Jones
Douglas E. Mochizuki
Linden Nishinaga
Celestine Palmer
Don Parker

Members Absent

Senator Richard Alarcon/Chris Modrzejewski
Mark Church
Lawrence T. Klein
Ashok S. Patwardhan
Daniel Shapiro

Staff Participating

Richard McCarthy
Karen Cogan
Robert Anderson
Abby Browning
Henry Reyes
Henry Sepulveda
Fred Turner
Vince Vibat

I. CALL TO ORDER/ROLL CALL

The meeting of the Seismic Safety Commission was called to order by Chairman Bruce Clark at 9:00 a.m. Executive Assistant Karen Cogan called the roll and confirmed the quorum.

II. CHAIRMAN'S REMARKS

Chairman Clark asked all participants to introduce themselves and their affiliations. He welcomed newly appointed commissioners Lucy Jones, Celestine Palmer; and Don Parker.

III. APPROVAL OF MAY 9, 2002 MEETING MINUTES

ACTION: Commissioner Mochizuki made a motion, seconded by Commissioner Nishinaga, that:

The Commission approve the minutes of the May 9 meeting as presented.

* Motion carried, 9 - 0.

IV. APPOINT NOMINATIONS COMMITTEE

Chairman Clark asked Commissioners Gates, Mochizuki, and Klein to serve as a Nominating Committee to recommend a chair for the Commission at the July meeting.

V. EXECUTIVE DIRECTOR'S REPORT

EERI Quake '06 Campaign

Executive Director Richard McCarthy noted the Commission discussed co-sponsoring EERI's Quake '06 Campaign at the last meeting, and he asked Senior Structural Engineer Fred Turner to provide an update.

Mr. Turner explained that Quake '06 is a four-year campaign put on by the Earthquake Engineering Research Institute (EERI). As part of the campaign, members of public will be informed and encouraged to make changes in the way they manage earthquake risk. In response to Commission questions at the last meeting, Mr. Turner said *.

Budget Prospects and Year-End Issues

Mr. McCarthy noted the Commission will need to develop strategies for dealing with budget cuts expected in July and later in the year.

Commissioner Gates reported the Commission will have a small budget surplus at the end of Fiscal Year 2001-2002, primarily due to vacant positions. He noted the Commission previously passed a resolution authorizing the Budget and Planning Committee to make decisions as to how best to spend the remaining funds.

Commissioner Nishinaga asked whether the AB 16 implementation issue had been resolved. Commissioner Gates responded that all participating agencies have been asked to pay their own expenses, and no objections have been raised. He said four commissioners will be members of the advisory board. Commissioner Gates said the only expenses to the Commission will be staff time and travel.

Commissioner Gates introduced a resolution requesting reimbursement for funds expended by the Commission in relationship to AB 16. He said the Department of Finance has agreed to the concept, and funding will come from the Public Education Facilities Bond Act. He recommended passing the resolution to clarify the Commission's intent to be reimbursed.

ACTION: Commissioner Gates made a motion, seconded by Commissioner Nishinaga, that:

The Commission adopt the reimbursement resolution as presented.

* Motion carried, 9 - 0.

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Update on FEMA Audit Appeal

Mr. McCarthy reported the Commission is still awaiting a decision on the appeal of the FEMA audit. He explained the audit challenged use of commissioner time as part of the Commission's matching funds and rejected the costs of printing extra copies. He said OES sent a letter a few days ago indicating \$239,000 was being deobligated and requesting payment from the Commission. Mr. McCarthy said he responded to OES, and the status of the appeal is being investigated.

Mr. McCarthy noted that if the Commission's appeal is rejected by FEMA, the Commission can approach the state's congressional delegation for assistance. He promised to provide a more detailed briefing at the next meeting.

California Earthquake Loss Reduction Plan

Mr. McCarthy reported FEMA accepted the Commission's *Plan* as the official mitigation plan for California, which enables the state to be eligible to apply for FEMA funds after a disaster.

Quake Ready Educational Videotape

Mr. McCarthy noted L.A. Laker star Shaquille O'Neal's did a \$1 million educational video for the Department of Insurance, but release of the tape has been delayed because of the Quackenbush scandal and investigation. Mr. McCarthy recommended the Commission push for its release once court clearance is obtained. He noted the remaining issues should be resolved before the next meeting.

Commission Website

Staff Engineering Geologist Bob Anderson presented a proposed contract renewal for \$10,000 with San Diego State University to provide further enhancements to the Commission's Website through June 30, 2005. He said some of the new features include video links, animation graphics, audio, and Web broadcasting capabilities.

ACTION: Commissioner Moy made a motion, seconded by Commissioner Nishinaga, that:

The Commission approve the \$10,000 contract with San Diego State University for Website services as recommended.

* Motion carried, 9 - 0.

VI. COMMITTEE REPORTS

Chairman Clark asked Commissioner Moy to chair the new AB 16 committee. He noted this committee will put together the advisory committee that will assess the feasibility of DSA developing standards for retrofitting existing buildings to the same level of performance the Field

Act provides for schools.

Commissioner Adelman suggested adding a representative from Los Angeles Unified School District to the AB 16 advisory committee. Chairman Moy noted the Commission would be discussing AB 16 in more detail as part of a later agenda item.

Chairman Clark asked Commissioner Jones to chair the Commission's Research Implementation Committee. He noted the Commission is required by law to update its research plan every five years, and because the last revision was done in 1996, one of the committee's first tasks will be completing the update within the next year.

VII. LEGISLATIVE REPORT

Director of Legislation Henry Sepulveda provided an update on Commission-sponsored bills as well as other legislation of interest to the Commission.

Mr. Sepulveda noted the Commission is sponsoring three bills: AB 977 (Alquist), regarding replenishment of the Commission's earthquake investigations account; SB 717 (Speier), a \$600 bond bill for seismic retrofits of residential and local government buildings; and AB 2002 (Alquist), regarding an urban search and rescue advisory committee. He said AB 977 and SB 717 have been put on suspense pending approval of the state budget, but AB 2002 is moving quickly and is expected to pass.

Mr. Sepulveda noted Assemblywoman Alquist's office has been approached about amending AB 2002 with provisions for technical amendments not related to the bill. He said the Commission's Legislative Advisory Committee reviewed the amendments and concluded they should not be accepted.

Commissioner Gates expressed his opinion that allowing the amendments would dilute the purpose of the bill. He recommended advising Assemblywoman Alquist not to accept the proffered amendments.

ACTION: Commissioner Gates made a motion, seconded by Commissioner Mochizuki, that:

The Commission recommend that the proposed amendments to AB 2002 be rejected.

* Motion carried, 9 - 0.

Mr. Sepulveda noted the Commission previously adopted an "oppose unless amended" position on AB 1000 (Simitian), a bill allowing design-build contracts for certain school construction projects. He reported Assemblyman Simitian accepted the Commission's proposed amendments and incorporated them in the latest version of the bill. He recommended the Commission change its position to neutral.

ACTION: Commissioner Moy made a motion, seconded by Commissioner Parker, that:

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The Commission change its “oppose unless amended” position on AB 1000 to neutral as recommended.

* Motion carried, 9 - 0.

Mr. Sepulveda noted SB 1992 (Perata), pertaining to gas shut-off valves, was amended to remove the statewide mandate. The bill now calls for the Department of Housing to look into the issue and make a recommendation to the Building Standards Commission. Mr. Sepulveda said no further Commission action is needed on SB 1992.

Similarly, Mr. Sepulveda said, SB 1350 (Burton) was amended to go forward only if federal funding is received. He noted the Commission is currently supporting the bill.

Mr. Sepulveda said AB 2406, an OES-sponsored bill, proposes to rename the Natural Disaster Assistance Fund to “Disaster Assistance Fund.” Staff has concerns the change would broaden the number of disasters eligible for assistance, diluting the amount of funding available for natural disasters. Mr. Sepulveda suggested an “oppose” position pending clarification of the bill’s intent.

Commissioner Gates noted the fund was specifically established for natural disasters, and he objected to changing the name to allow the funds to be used for other purposes. He said the Legislative Advisory Committee recommends an “oppose” position.

Commissioner Nishinaga asked what other types of disasters would be eligible for funding if the bill succeeds as written. Mr. Sepulveda responded that the broader category of disasters could include terrorist attacks.

ACTION: Commissioner Gates made a motion, seconded by Commissioner Moy, that:

The Commission adopt an “oppose” position on AB 2406.

* Motion carried, 9 - 0.

Mr. Sepulveda said he received a fax from State Geologist Jim Davis expressing concerns about SB 1500 (Johnson), the bill requiring disclosure of seismic hazards maps. He noted the Commission requested specific amendments, and Senator Johnson complied by removing problem language. However, the bill was amended again on June 11 to change the disclosure requirements in a way that might be misleading to prospective buyers, thus creating potential liability for the state. Mr. Sepulveda noted the Governor’s Office opposed an earlier version of the bill.

Mr. Sepulveda said Mr. Davis recommends the Commission adopt an “oppose unless amended” position.

Chairman Clark clarified an “oppose unless amended” position means the Commission staff communicates suggestions for specific amendments to the author. He recommended the staff consult with California Geologic Survey staff to articulate appropriate amendments.

ACTION: Commissioner Moy made a motion, seconded by Commissioner Jones, that:

The Commission adopt an “oppose unless amended” position on SB 1500.

* Motion carried, 9 - 0.

Mr. Sepulveda reported the Seismic Safety Commission’s budget for next year is not in question. He said the Commission is looking at a 5 percent cut in salaries in addition to a 3 percent across-the-board cut.

VIII. ADVISORY COMMITTEE TO INVESTIGATE EARTHQUAKE SAFETY OF PRIVATE BUILDINGS FOR USE AS SCHOOL FACILITIES (AB 16)

Commissioner Moy invited Mr. Turner and Senior Engineer Henry Reyes to discuss recommendations regarding AB 16, the bill regarding retrofit standards for private buildings converted to school use.

Mr. Turner explained that the Field Act is one of the oldest and most respected law pertaining to seismic safety protection. The Long Beach earthquake in 1933 had a serious impact on California schools; 70 schools were destroyed and 120 were damaged. In response to the failures, the state enacted a series of standards to improve construction design and quality in order to protect students in California schools. Mr. Turner said the Field Act puts the State Architect rather than local governments in charge of overseeing K-12 school construction. Construction plans undergo rigorous reviews, designers are required to observe construction in progress, and inspections are performed by qualified professionals. Mr. Turner noted Field Act standards apply both to new construction and to strengthening of existing buildings.

Mr. Turner said enactment of the Field Act prompted numerous complaints about the impracticality of retrofitting existing buildings. The 1939 Garrison Act required seismic retrofit of older buildings and held school districts liable for failures unless they made repairs. In 1964, the state attorney general issued an opinion affirming the duty of school boards to undertake seismic evaluations and repairs and clarifying that school board members could still be held liable for allowing use of pre-Field Act buildings. The Garrison Act was amended in 1968 to state that any pre-Field Act school found to be unsafe could not be used after 1975 unless repaired. Another amendment in 1974 authorized a two-year extension of the 1975 deadline and clarified retrofits were required to comply with full Field Act standards. Mr. Turner said damage to pre-Field Act buildings in the 1971 San Fernando earthquake led to an acceleration of repairs.

Mr. Turner said most of California’s K-14 existing building stock complies with the Field Act, but there are still a few exempt buildings. Complying with Field Act requirement typically costs

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about 2 to 4 percent more than non-Field Act buildings, but the benefit is superior safety performance and enhanced repairability. Mr. Turner noted the Field Act regulations are updated every three years, and there have been major improvements in seismic safety over many years. Buildings constructed after the 1933 Field Act are not required to comply with current code unless they are found to be unsafe or undergo major alterations.

Mr. Turner highlighted more recent changes in state policy. He said AB 300, a 2000 bill sponsored by the Commission, required the State Architect to identify early Field Act buildings, or those built between 1933 and 1976, and evaluate their safety. He noted the report was completed last December and is still awaiting the governor's release.

Mr. Turner said AB 16 will put \$25 billion in bond measures on ballots in 2002 and 2003. One provision directs the Seismic Safety Commission to establish an advisory committee to determine if the State Architect can develop regulations to retrofit non-Field Act buildings to comply with the Field Act.

Mr. Turner directed attention to the materials in Tab G in the meeting packet. He said California is faced with a growing student population and a lack of available sites for building new schools, so districts are increasingly looking at buying existing buildings and converting them to school use. However, because existing commercial and office buildings were constructed under various codes and standards, seismic safety is variable. When a change in occupancy occurs, the building code requires compliance with current requirements for that occupancy, so many building owners are interested in finding out how they retrofit existing building to meet applicable Field Act standards for schools.

Commissioner Palmer asked on what grounds some buildings were exempt from the Field Act. Mr. Turner responded that over the past 69 years, individual school districts have been able to get legislation enacted to give exemptions for particular buildings. He estimated there may be 100 remaining exempt buildings, some of which may be temporary and of minor importance. Mr. Turner suggested the staff consult with the Division of the State Architect as to the existing exemptions.

Mr. Reyes presented the proposed scope of work for the AB 16 Advisory Committee. He said staff envisions five or six meetings. The committee will learn about DSA's program for existing buildings, conversions, and new construction, including performance goals, measures to ensure compliance with plans and specifications, site information, materials testing, nonstructural hazard abatement, and construction verification. Mr. Reyes said design professionals and engineers will be invited to present state-of-the-art knowledge about retrofitting. The committee will determine what performance level is equivalent to Field Act, solicit advice from stakeholders, and make recommendations to the Seismic Safety Commission. Mr. Reyes noted the end product of the committee's deliberations will be a series of findings and recommendations to the Legislature like the Commission's 2001 policy report on hospital seismic safety. Mr. Reyes said the issues of cost-effectiveness of seismic retrofit and assessing the necessity of and alternatives to the Field Act are outside the scope of the committee's work.

Mr. Reyes noted the proposed makeup of the committee was approved by the Commission at the May meeting. He said the current plan calls for a total of twelve members, four of which would be commissioners. He reviewed the proposed committee membership. Mr. Reyes added the four Commission representatives will be Commissioners Adelman, Gates, Moy, and Shapiro.

Mr. Turner recommended the Commission approve the appointment of Commissioner Moy as chair of the AB 16 Advisory Committee, and appoint Steve Newsom to represent the Department of Education, Abe Hajela* to represent the California School Boards Association, and Gary McGavin to represent the Coalition of Adequate School Housing. Mr. Turner noted the statute calls for the committee to hold its first meeting by August 19.

Commissioner Adelman asked about the procedure in the Commission's bylaws for appointing committees and committee chairs. Mr. McCarthy explained the Commission chair nominates committee chairs, the committee chairs propose members and run the committees, and the Commission approves the appointments.

Chairman Clark read the pertinent sections of the Commission's bylaws to clarify the procedure.

ACTION: Chairman Clark made a motion, seconded by Commissioner Gates, that:

The Commission appoint Commissioner Stan Moy to chair the AB 16 Advisory Committee and Commissioner Lucy Jones to chair the Research Implementation Committee.

* Motion carried, 9 - 0.

Commissioners reviewed the proposed composition of the committee.

Commissioner Jones observed that people with expertise in school construction appear to be well represented. She noted many of the converted buildings will be types of construction not normally used for schools, so it would be helpful to add someone with expertise in non-Field Act buildings as well. Mr. McCarthy noted technical experts can be invited to testify and provide the committee with information pertaining to specific points.

ACTION: Chairman Clark made a motion, seconded by Commissioner Jones, that:

The Commission appoint Commissioners Adelman, Gates, and Shapiro to represent the Commission on the committee.

* Motion carried, 9 - 0.

Commissioner Adelman noted AB 16 came about because of Los Angeles Unified School District's problems making an existing building comply with the Field Act. He said the district is facing the difficult challenge of providing new schools in an urban area where building sites are scarce and existing buildings are plentiful. He recommended appointing a school district representative to the committee to provide expertise on school districts' concerns. In particular,

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he proposed finding a member from the L.A. Unified School District.

Mr. Turner said the representative from the California School Boards Association had been designated to provide the schools' perspective, but from a statewide vantage point. He emphasized the importance of preserving a statewide focus rather than narrowing the issue to a particular building or district. Mr. Turner added that individual experts can be invited to present information to the committee.

Commissioner Adelman suggested allowing the committee chair to propose a school district member.

ACTION: Commissioner Adelman made a motion, seconded by Commissioner Palmer, that:

The Commission add a local school district representative to the AB 16 Advisory Committee.

* Motion carried, 9 - 0.

Chairman Clark thanked Mr. Turner and Mr. Reyes for their presentation.

IX. IMPLEMENTING RESEARCH RESULTS

Chairman Clark noted that in preparation for updating the Commission's research plan in the coming months, the staff invited representatives of key research agencies to discuss new technologies and applied research.

Pacific Earthquake Engineering Research (PEER) Center

Dr. Jack Moehle reviewed recent activities of the PEER Center. He explained the center is one of three national science foundations focusing on earthquake research. The mission of PEER is to advance performance-based earthquake engineering to meet the needs of various stakeholders. Dr. Moehle said UC Berkeley hosts the center, and a number of universities and organizations are cosponsors.

Dr. Moehle noted performance-based engineering is a tool for analyzing and managing risk. By working to achieve a certain performance level, design professionals and building owners can plan buildings to protect and meet the needs of their customers and clients. Defining the appropriate level of performance is a policy decision based on seismic vulnerability, repair options, and costs. Dr. Moehle cited the BART retrofit project as an example of a performance-based analysis.

Dr. Moehle reviewed some of the applied earthquake research projects developed at the PEER Center. In the geosciences area, he indicated PEER researchers had developed a strong motion database, tools for rapid estimates of ground motions, probabilistic site classifications based on soil types. Dr. Moehle said a number of products deal with existing structures and new construction, such as models for studying the behavior of pier foundations, research on rocking

of rigid blocks, models for collapse of reinforced concrete columns, and new applications of load resistance factor methods.

Dr. Moehle noted the primary users of PEER products are practicing engineers. The PEER Center has a business and industry partnership program to involve partners in research and help disseminate the results to the field. In addition, PEER holds an annual meeting, produces technical reports, and works with code development agencies. Dr. Moehle described the PEER Center's Utility and Transportation Lifeline Program, a joint effort of the California Energy Commission, Department of Transportation, and PG&E. He said PEER is also working with FEMA and the Applied Technology Council on a number of performance-based earthquake engineering guideline development projects.

Dr. Moehle noted funding for PEER comes from the National Science Foundation, potentially for ten years. PEER was approved for additional five-year funding after its fourth year, so funding is available at least through 2006. PEER also works cooperatively with a number of other research agencies. Dr. Moehle expressed concern about the impact of the state budget crisis on California's required matching funds. He said PEER would like to expand its programs, and he advocated increased funding.

Commissioners requested that presenters provide the staff with copies of their slide presentations and handouts.

Chairman Clark thanked Dr. Moehle for his remarks.

California Department of Transportation (Caltrans)

Dr. Cliff Roblee noted Caltrans has two seismic research programs, the Seismic Bridge Details Development Program, funded at about \$500 million per year by Caltrans, and co-sponsorship of PEER's lifelines research program, funded with about \$1 million from Caltrans and \$1.5 million from other partners.

Dr. Roblee explained the Seismic Bridge Details Development Program involves large-scale proof-testing of retrofit details and new bridge designs and development of innovative bearings and other devices. He said the lifelines common-interest research program focuses on studying earthquake impacts and engineering on the demand side. The goals of the program are to develop better methods for addressing ground motion, ground deformation, and performance of structures. Dr. Roblee noted research activities include collecting and analyzing data from recording stations, developing and testing a new attenuation model, joint validation of risk codes, establishing a ground motion design library, and research on ground deformation, fault surface rupture, lateral spread, and foundation loads.

On the operational side, Dr. Roblee said Caltrans is looking for network reliability analyses that account for route impacts, traffic delays, recovery times, and regional economics losses. He noted real-time technologies are improving research capabilities in these areas. Dr. Roblee observed there is little data on the cost of achieving performance levels, so Caltrans is initiating a

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project in that area.

Dr. Roblee noted real-time technologies are improving response capabilities, and he cited the shake map efforts as an example of that kind of progress. He said shake maps can be used to prioritize different bridge designs in terms of response efforts.

Dr. Roblee reviewed other applied research projects. As mentioned before, he noted, the Seismic Bridge Details program involves proof-testing of details to verify designs and studying the interaction between soils and foundations. Lifelines research projects being done in conjunction with various partners include a design ground motion library and development of consensus regarding the library's contents, a new fault rupture model, a new attenuation design tool, an open-seas platform monitoring station, a consensus catalog, a three-dimensional velocity model, and physics-based earthquake modeling.

Dr. Roblee discussed Caltrans' implementation of earthquake research. He noted NSF is improving its outreach programs, and some industry groups are incorporating innovative methods and designs. Dr. Roblee said there is still a major gap between research findings and getting users to implement new practices. He reviewed some of the barriers to implementation and observed that the most effective way of implementing new practices is through big projects. However, Dr. Roblee noted, major projects can be infrequent and not always applicable to standard design. In addition, some design professionals are resistant to using new approaches, relying instead on proven practices. Dr. Roblee recommended addressing this challenge by getting users involved in the research process. He compared a user-driven research process to one driven by principal investigators.

Dr. Roblee recommended that the Seismic Safety Commission's Research Plan emphasize research projects such as large-scale physical testing, mundane projects like seismological and geological data gathering and synthesis, establishing inventories of physical facilities and assessing their vulnerabilities, validating standards and guidelines for existing design models, encouraging users to do trial applications with new design tools, and better understanding economic impacts. He emphasized the importance of defining "implementables" at the beginning of a project and focusing on a user-driven research model.

Chairman Clark thanked Dr. Roblee for his presentation. He encouraged him to provide information to the staff on successful Caltrans research implementation projects. Dr. Roblee said he would provide that information.

California Earthquake Authority

Mr. Milo Pearson introduced Mr. Stan Devereaux, Director of Public Affairs. Mr. Pearson explained that the California Earthquake Authority (CEA) was created in 1996 in the aftermath of the Northridge earthquake in response to the lack of availability of residential earthquake insurance coverage from commercial carriers. Now in operation for five years, CEA has approximately 800,000 policy holders, writes approximately \$450 million in premiums annually, and has roughly \$7 billion in claims-paying capacity. Mr. Pearson noted CEA currently

represents two thirds of the residential market in California.

Mr. Pearson said that since its inception, CEA has been funding research related to earthquake insurance. He noted that until the mid-1980's, there was little incentive to conduct research on earthquake insurance, so there was little data on actual risks and damage levels. In 1984, the Legislature required all commercial carriers offering homeowners insurance to provide earthquake insurance as well. The 1995 Northridge earthquake prompted research on models to help insurance companies develop fair rates for earthquake insurance and manage earthquake exposure.

Mr. Pearson described three research programs funded by CEA: a project with CUREE providing post-event repair of residential homes; another project with Cal Tech focusing on mitigation premium incentives; and a third project on post-event damage assessment. He said practical applications include guidelines for engineers and insurance adjusters, a comprehensive handbook for engineers and adjusters, computer simulations to assess appropriate premium discounts for mitigation, studies of the costs and benefits of mitigation, and a tool for rapid estimation of claims payouts for earthquake damage.

Mr. Pearson said CEA has funded approximately \$1 million in research so far. He noted the practical applications of CEA's research on home repair and mitigation can benefit the entire state. He added CEA is in the process of reviewing its rate structure, and recent information from USGS is incorporated in the rating model.

Mr. Pearson noted CEA's participating carriers have a major stake in insurance-related research, but they have provided little funding so far. He said CEA has been talking with some of the major carriers about paying for some of the repair and mitigation work. In addition, he added, CEA has been exploring joint powers agreements with other potential funding entities with an interest in research.

Commissioner Mochizuki commented that the problem with earthquake insurance for most consumers is expensive premiums and high deductibles. He asked how these problems are being addressed. Mr. Pearson responded that deductibles for earthquake insurance have been high historically, and especially after the Northridge earthquake. He noted CEA's program was based on standard industry deductibles at its inception. Mr. Pearson said CEA now offers policy holders an opportunity to purchase 10 percent deductibles instead of the standard 15 percent, as well as option higher contents coverage. Mr. Pearson added that lower deductibles and premiums will come in time.

Commissioner Nishinaga commented that many consumers are reluctant to purchase earthquake insurance because they fear carriers will be unable to pay claims in a major disaster. Mr. Pearson said CEA's calculations at the current time indicate the earthquake insurance market can sustain losses exceeding Northridge, but paying claims will probably necessitate using reserves and reinsurance funds.

Chairman Clark thanked Mr. Pearson for his presentation.

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Consortium of Universities for Research in Earthquake Engineering (CUREE)

Mr. Bob Reitherman, Executive Director, CUREE, introduced Ms. Jill Andrews, Director for Research Outreach, Office of the Provost, Cal Tech; and Ms. Kelly Kobine*, structural engineer, GFTS Engineers. He noted CUREE was established in 1988 as a nonprofit consortium of 27 universities and 350 individual professors.

Mr. Reitherman said CUREE is currently engaged in a variety of research projects with Kajima Corporation. After the Northridge earthquake, CUREE sponsored workshops and conferences about research and helped disseminate information about steel-frame buildings as a result of the SAC research project. Mr. Reitherman noted CUREE is also working on developing a consortium network for earthquake simulation. He said other CUREE projects include the CEA post-event residential repair program mentioned by Mr. Pearson and a Cal Tech wood frame project.*

Ms. Andrews reviewed applied research activities and outreach activities. She noted key programs for the general public include an interactive display and exhibits, curriculum materials for schools, and earthquake preparedness kit center, a small-scale shake table, and educational publications. For students and professionals, CUREE offers Web-based educational modules, short courses, workshops, videos, and seminars highlighting new codes and standards. Ms. Hopkins said CUREE also engages in outreach to the general public through a series of video spots to be aired on television, media events, and a Website.

Ms. Kobine* discussed how results from the Cal Tech wood frame project and other research is disseminated to the field. She said CUREE looked at both construction of new wood frame buildings and retrofit of existing buildings. The project examined codes and standards as well as actual design and construction practices, and stakeholders were involved in designing the research. Ms. Kobine noted the eventual outcome will be a series of recommendations based on the research results, and the findings will be conveyed to various code adoption agencies, design professionals, building professionals, and industry representatives. She suggested the Commission's *Homeowners Guide to Earthquake Safety* might be a good vehicle for disseminating information to the general public.

Ms. Kobine* gave examples of some of the recommendations being made regarding wood frame construction. She noted they range from simple changes in methods and materials to broad philosophical and policy-related issues.

Commissioner Adelman asked about the status of the effort begun in the late 1980's regarding conventional wood framing. Ms. Kobine* said the recommendations will address prescriptive construction for certain configurations on an engineered basis.

Chairman Clark thanked the CUREE speakers for their remarks.

Lawrence Berkeley National Laboratory

Ms. Deborah Hopkins introduced her colleague, Mr. Murat Karaja*, and Mr. Dan Gilbert, Hewlett-Packard. She said Lawrence Berkeley National Laboratory and Hewlett-Packard are working on a demonstration project addressing engineering barriers to integrating new wireless sensor technologies for large-scale applications. Ms. Hopkins explained that wireless technologies can be used to validate construction models. In addition, after earthquakes, they can assist in both communications and damage assessment.

Ms. Hopkins provided a brief background on Lawrence Berkeley National Laboratory. She noted the main focus of the lab has traditionally been high-energy physics, but theoretical research has also led to more practical applications in the fields of engineering and construction. She cited research for fuel-efficient cars, thermography and acoustics in assessing civil infrastructure damage, and an online spot weld inspection system for the auto industry as examples. Ms. Hopkins said Lawrence Berkeley National Laboratory is also working on applied research projects with the mining industry and telecommunications that might be applicable to other construction settings as well.

Hewlett-Packard

Mr. Gilbert said Hewlett-Packard's partnership with the Lawrence Livermore National Laboratory gives the company an opportunity to work with research scientists on research projects that will produce benefits in the commercial environment. He discussed Hewlett-Packard's involvement in research on wireless sensor technologies. Mr. Gilbert noted the project applies information technologies to the fields of energy and resource management, healthcare, and monitoring for seismic and other hazards.

Ms. Hopkins added the research has important implications for building design and construction, performance monitoring, and validation of models. Using the Turkish earthquake as an example, she described how wireless sensor technologies can be used to deploy post-earthquake response resources, identify locations with the most damage, signal alarms, and communicate with inhabitants.

Mr. Gilbert noted research findings can be used to more accurately determine insurance premium rates and to lower building costs, which will benefit consumers. He added one of the biggest challenges in employing the new technologies will be monitoring and maintenance of the sensors.

Chairman Clark asked if there was any research underway on cheaper strong motion instruments so they can be more widely deployed. Ms. Hopkins responded that wireless sensors are much less expensive than older instruments. Mr. Gilbert said that H-P is working on tiny and inexpensive MEMS accelerometers; he noted it takes high volume to drive costs down. He added that wireless sensors can be particularly useful in retrofitting existing buildings.

Chairman Clark thanked the presenters for their information.

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X. MISCELLANEOUS/GOOD OF THE MEETING

There were no other items brought to the Commission's attention.

XI. ADJOURNMENT

There being no further business, it was moved and seconded that the meeting be adjourned. The meeting was adjourned at 1:15 p.m.

Karen Cogan
Executive Assistant

Approved by:

Richard McCarthy
Executive Director